OWNER'S MANUAL

INSTALLATION and OPERATION INSTRUCTIONS

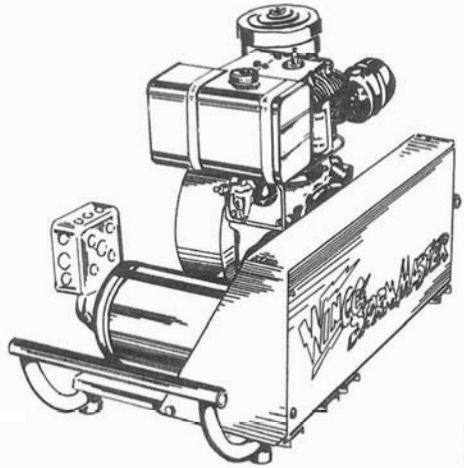
Economy-Engineered WINCO

for

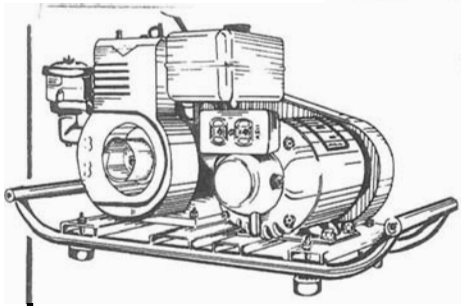
A. C. GENERATORS

- Model 700 Series
- Model 1800 Series

Model 3030 Series



MODEL 3030



MODEL 1800

MODEL 700

If any correspondence is required regarding these generators, always be sure to furnish the model number and serial number stamped on the generator nameplate.

WINCHARGER CORPORATION

SIOUX CITY 2, IOWA, U. S. A.

Form SR214, Part No. 20757

INSTALLATION AND OPERATION INSTRUCTIONS FOR WINCO A.C. GENERATORS

Model 700 Series
Model 1800 Series
Model 3030 Series

MODEL			WATTAGE		SPEED			ENGINE	
With Engine	Without Engine	Nominal*	Motor Starting	Generator R.P.M.	Engine R.P.M.	Pulley Ratio	Make	Model	Max. H.P.
700-11	700-1	500	700	3600	3460	1.04	Briggs & Str.	6	2.0
700-12	700-2	500	700	3600	3460	1.04	Clinton	B700	2.0
700-13	700-3	500	700	3600	3460	1.04	Continental	AU7B	2.0
700-14	700-4	500	700	3600	3460	1.04	Lauson	RHS	2.0
1800-11	1800-1	1000	1800	3600	3460	1.04	Briggs & Str.	8	2.5
1800-12	1800-2	1250	1800	3600	3460	1.04	Clinton	D-1100	3.1
1800-13	1800-3	1350	1800	3600	2975	1.21	Cushman	M6	3.0
1800-14	1800-4	1250	1800	3600	3460	1.04	Lauson	TLH	3.0
1800-15	1800-5	1350	1800	3600	2975	1.21	Wisconsin	ABN	4.6
3030-11	3030-X	2000	3000	3600	2975	1.21	Briggs & Str.	14	5.1
3030-12	3030-X	2000	3000	3600	2975	1.21	Briggs & Str.	23	8.3

*Nominal wattage is at 1.0 Power Factor. All units are rated at 115 volts, single phase, 60 cycles per second. The voltage varies with the speed at which the generator is driven and on the load being used.

The generators only for above units are referred to as Model 700-0, 1800-0, and 3030-0 respectively. In the instructions all Model 1800's are referred to as 1000 watt. Models 3030A and 3030B are for tractor belt drive—generator specifications are same as for 3030-X.

WINCHARGER CORPORATION
Sioux City 2, Iowa, U. S. A.

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I. INTRODUCTION

Each generator is carefully inspected at the factory and "run-in" until the brushes are satisfactorily seated. The unit is then carefully checked for correct output under average operating conditions. NO GENERATOR IS SHIPPED UNLESS IT PRODUCES ITS FULL RATED CAPACITY, NOR UNTIL IT HAS PASSED RIGID INSPECTION TESTS. If upon installation a new generator does not work properly, check all of the electrical connections and the generator speed before concluding that the generator is not performing satisfactorily.

When unpacking the machine, be sure to inspect it carefully to see that no damages occurred in transit. If damages are noted, notify the transportation company immediately and have them write the nature of the damages on the freight bill, so that a claim can be filed if necessary.

Each AC generator is guaranteed to be free from defects in workmanship and material arising in connection with normal usage for a period of one year, provided that the owner returns his guarantee registration card within 10 days after purchasing the unit. Fill in the information requested on the registration card and return it, so the guarantee can be issued to you.

II. INSTALLATION

When using the unit as a portable generator, merely plug the power tools, lights, etc. directly into the outlet terminals. The outlet box is equipped with lock-type receptacles which prevent the plugs from working loose.

To operate permanently connected motors, etc. on a standby basis, provision must be made to prevent the generated current from "feeding back" into the power line where it could be a hazard to linemen and other users.

ALL WIRING IS TO BE DONE IN CONFORMANCE WITH NATIONAL ELECTRICAL CODE AND WITH STATE AND LOCAL REGULATIONS.

The conductor from the transfer switch to the generator can be made of No. 14 type S cord for distance up to 25 feet. Always use the twist-lock plug for making these connections permanently.

When starting the generator, turn off the load or reduce it. If too many light bulbs are left on, the generator may fail to build up voltage.

When a three pole double-throw switch is connected to a 115-230 volt system as shown in Figure 1, the current from the generator is available on both main branches. Any 220 volt appliances connected to the circuit will remain inoperative.

If the owner wants to use only part of the electrical circuits, a two-pole, double throw switch can be connected in one or more of the branch circuits as shown in Figure 2. So many different methods of wiring are encountered in the field that no specific transfer switch recommendation can be given. However, an electrician who thoroughly understands the problem should be obtained to make the installation.

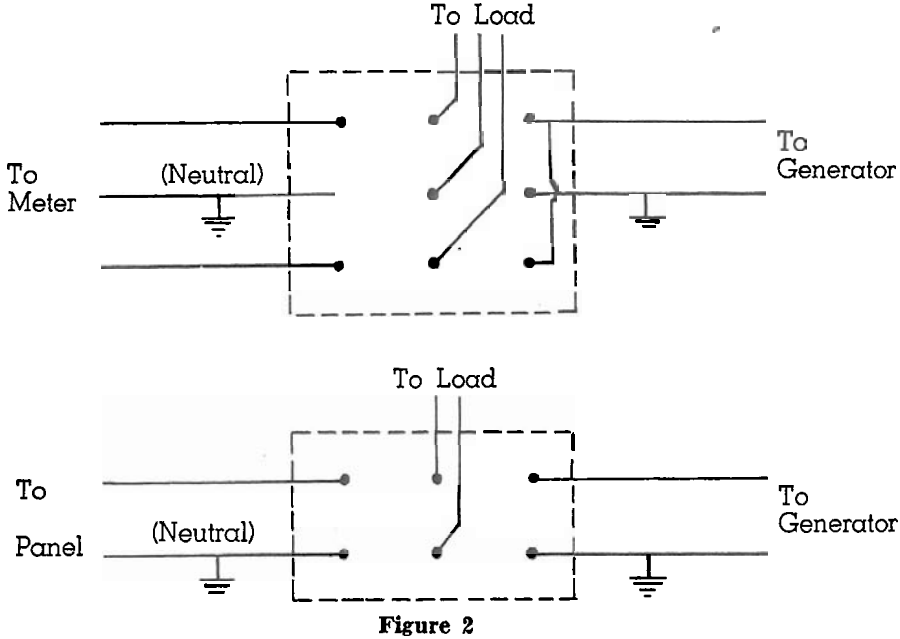

Figure 2

III. FRAME

All 500 watt and 1000 watt models have the necessary holes for mounting various types engines. Figure 3 shows the holes which are used for mounting the following types of engines:

Holes	Type Engine
A	Briggs & Stratton No. 8
A	Briggs & Stratton No. 6
A	Continental 7B
B	Clinton D-1100 (A base)
B	Clinton B-700 (New base)
C	Cushman M6
D	Lauson TLH
E	Wisconsin ABN
F	Lauson RSH
G	Clinton D-1100 (B base)
G	Clinton B-700 (Old base)

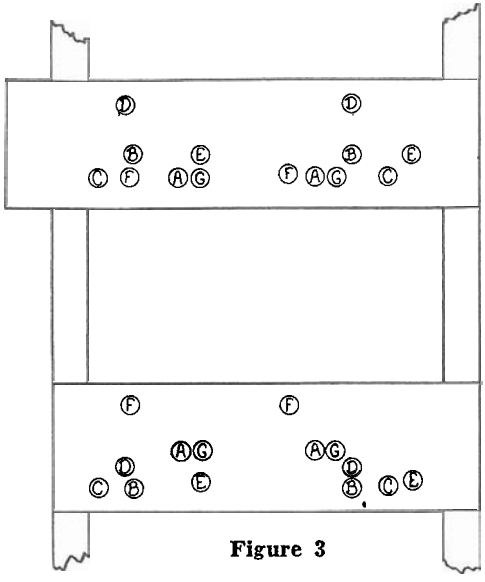

Figure 3

Two sets of holes are drilled for mounting the generators on the cross members. The 500 watt units use the set of holes nearest the belt guard.

To install the engine on these frames, proceed as follows: Remove the belt guard; mount the engine in place and secure it rigidly with the four bolts furnished. Remove three of the bolts holding the generator to the frame, leaving only one of them in position as shown in Figure 4. The generator can then be pivoted on the single bolt to install the belt.

After the belt is put on the pulleys, pivot the generator so the generator shaft is parallel to the cross braces. If it is found that the belt is too tight or too loose, the pivoting bolt should be loosened and the generator moved forward or backward as

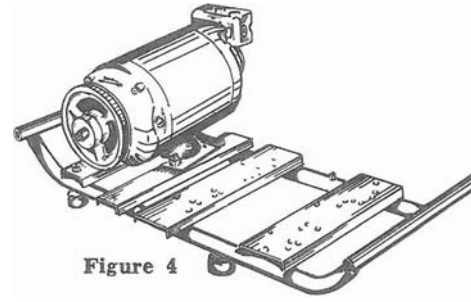

Figure 4

required. The belt should deflect about ¼" when a pressure of 6 lbs is applied midway between the pulleys. After the proper position has been determined, install the three remaining bolts in the generator base and tighten securely. Then recheck the belt lineup using a straight edge across the belt pulleys as shown in Figure 5. Finally replace the belt guard.

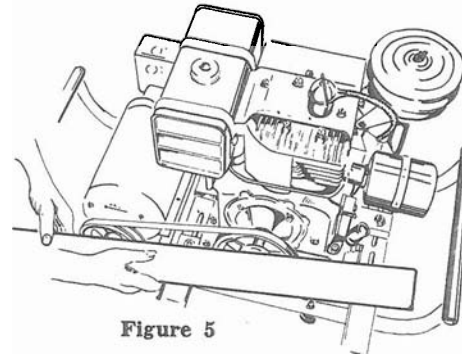

Figure 5

2000 WATT MODELS

The V belt and two engine pulleys are furnished with units shipped without engines. One pulley has a ⅝" bore, and the other 1" bore. Either one or the other pulley will fit practically all engines, but if it does not the pulley will have to be bored to suit or a bushing will have to be installed.

To mount the engine on the frame proceed as follows: Loosen the bolts on the adjustable rails shown in Figure 6. Mount the engine with the four bolts furnished, leaving the nuts loose. Using a large screwdriver or small bar, force the generator

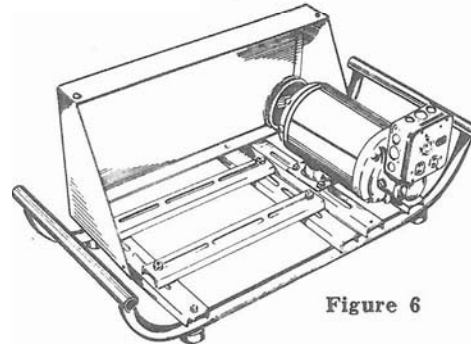

Figure 6

back to tighten the belt as shown in Figure 7. The belt should deflect about ¼" when the pressure of 7 lbs. is applied midway between the pulleys. Recheck the lineup on the belt with the straight edge, as shown in Figure 5. If necessary, the pulley on the generator can be moved slightly to effect proper lineup. Be sure to tighten the Allen screw holding the generator pulley in place.

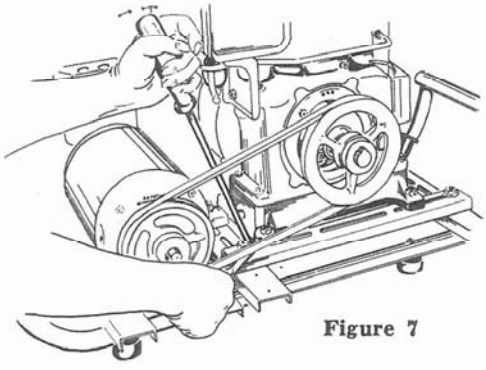

Figure 7

IV. GENERATORS

DESIGN

These generators are self-excited AC types with the commutator located at one end (See Figure 8) and the slip rings located at the opposite end of the armature. (See Figure 9—The 500 watt and 2000 watt models do not have klixon shown). There are both a DC winding and an AC winding on the armature; the only purpose of the DC winding is to produce "direct" current to energize or excite the field coils—see

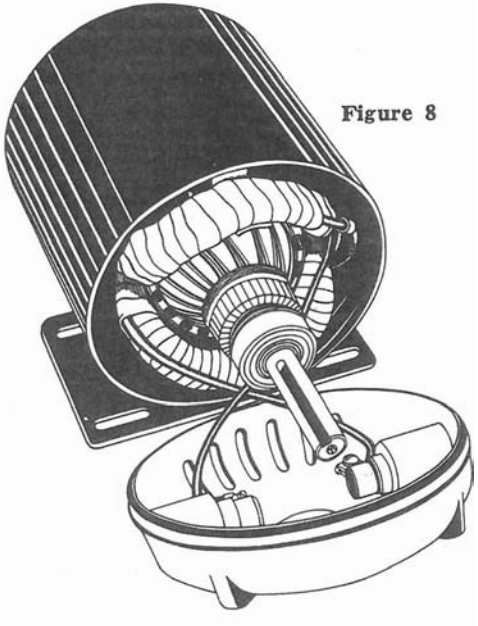

Figure 8

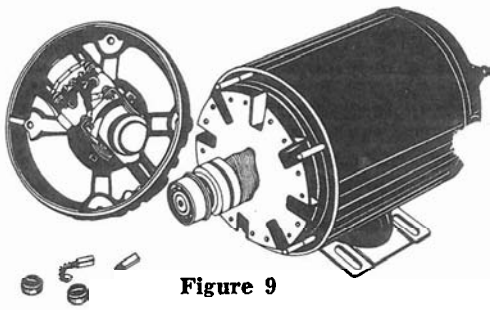

Figure 9

schematic diagram, Figure 10. The drive pulley is on the commutator end and the AC box is on the opposite end. The proper direction of rotation is indicated by an arrow on the end of the generator.

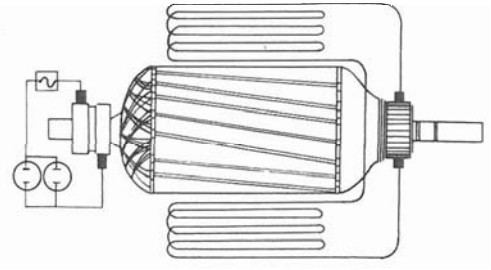

Figure 10

Performance Characteristics

Providing that constant generator speed is maintained, the output voltage remains reasonably constant from no load to full load. No rheostat is necessary to adjust the voltage.

The engine governor must be working properly to maintain reasonably constant voltage. When lights or appliances are turned on, the generator must produce more electric power. The engine must consequently supply more power to the generator.

No engine maintains perfect speed regulation, particularly as it approaches a fully loaded condition. The generator speed must be 3600 revolutions per minute to produce 60 cycles per second at rated voltage. However, since there is a slight speed variation it is best to operate the unit at a slightly higher speed with no load connected. Then, as lights or appliances are used, without resetting the engine throttle the output will be at, or perhaps slightly below, the specified voltage and frequency. If necessary the throttle setting can be increased slightly if full rated output is desired continuously.

If the engine governor is sluggish or does not work properly, its speed will decrease considerably when the electrical load is

increased. The resulting decrease in generator speed may cause lights to be dim and appliances to be lacking in power. (See engine instructions regarding governor).

On an average the frequency and voltage will drop approximately as shown in Figure 11 on these units when driven with engines normally supplied. Larger engines which maintain better speed control tend to maintain better voltage stability.

% of Rated Capacity	Voltage	Frequency (cycles per second)
0	130	61
20	128	60+
40	126	60
60	123	60—
80	119	59
100,	115	58+

Figure 11

Speed

The speed of the generator is extremely important and should never be below 3450 rpm. If the generator speed is too low, it will not produce its rated output and, if fully loaded, will heat excessively. If low voltage under load is encountered, be sure to check the generator speed with an accurate tachometer before concluding that the generator is defective.

The generators supplied with engines have the governor set to produce a generator speed of 3600 rpm at approximately 60% of rated output and should not be readjusted unless it is done with an accurate tachometer. Excessive speed not only produces added strain on generators, but abnormally high voltage also materially shortens the life of the electrical devices used. Even though generators may be equipped with klixon thermostatic overload switches or fuses, they can be overloaded if run at excessive speed.

Overload Protection

The 1000 watt models are equipped with klixon thermostatic switches. If the switch opens due to overload, the generator should be allowed to cool for several minutes, and the red button adjacent to the outlet box pressed down. If the generator has been allowed to cool sufficiently, the switch can be snapped back in place, thus completing the circuit.

The 500 watt models are not equipped with any type of overload protection. The load line should be fused using fuses of suitable type and capacity.

V. ENGINES

ENGINES ON AC GENERATORS ARE SHIPPED WITHOUT OIL. Be sure to fill the crankcase to the proper level and fill the gasoline tank before starting. See engine instruction book for grade and type of oil.

Engine operating and maintenance manuals furnished by the engine manufacturer are supplied with all units shipped with engines. Be sure to follow these instructions. If the generator was obtained separately, also be sure to obtain the engine manual. In case of engine trouble contact engine manufacturer's local representatives for assistance or repair parts.

VI. POWER REQUIREMENTS

The maximum wattage for each of the units covered by this manual is given on Page 2. Engines of different manufacture and of larger capacity can be used, but the electric load should not exceed the maximum wattage shown for sustained operation. Smaller engines than shown on the table on Page 2 can be used for any model, but the electric load must be reduced proportionately. For example, on the 2000 watt models any engine from one H.P. can be used. Such engines, however, would not have adequate power to furnish the current required to start motors. (See "Use of AC Motors").

If the engine used to drive the generator does not have sufficient power to drive the generator in areas of high altitude and high temperature, it is important to remember that engines lose power at the rate of about 3% for each 1000 feet of altitude and 1% for each 10 degrees above 60 degrees Fahrenheit at sea level. In addition to this, a good quality fuel must be used to get the full rated output from any engine. Most engine manufacturers recommend that the engine load should not exceed 85% of rated horsepower.

VII. USE OF A.C. MOTORS

The maximum rated wattage of the generators for starting motors is given in the table on Page 2. For the same motor size, split-phase motors such as are normally used on washing machines, refrigerators, etc., require more starting current than others such as capacitor-start and induction-repulsion types. In general the power requirements for starting and running various sizes of electric motors is approximately as follows:

H.P.	Running	Starting
1/8	200	
1/6	300	900-1500
1/4	400	1200-2000
1/3	450	1350-2250
1/2	600	1800-3000

The motor starting current is limited by the engine as well as the generator. It will be observed from the table that the 500 watt models are recommended for only small electric tools and appliances using universal type motors of 1/8 H.P. or less. The 1000 watt models, when equipped with an engine of adequate power, can be expected to start 1/6 H.P. motors and some 1/4 H. P. types. The 2000 watt models, when equipped with an engine of adequate size, will start electric motors up to and including 1/2 H.P. For maximum starting capacity larger motors such as the Briggs & Stratton Model 23 should be used.

Motors usually have a power factor of approximately 70%. That is, a motor that uses 700 watts at 110 volts actually requires as much current (amperes) as 1000 watts (700 ÷ .70) of light bulbs or other loads with 100% power factor. This fact must be taken into consideration when considering the maximum motor load a generator will handle.

VIII. MAINTENANCE

A. BRUSHES

Check the brushes every 500 hours of operation. They are easily removed by removing the brush holder caps. The spring and pigtail lead is supplied as an integral part of the brush. When the brushes have worn down to approximately ½ inch, they should be replaced.

B. DISASSEMBLY

These generators can easily be disassembled for inspection. (See Figure 8 and 9). Merely remove the "thru bolts" and tap the end castings outward, using a light hammer and chisel applied to a projecting part of the casting.

C. BEARINGS

Ball bearings are standard equipment on all Winco AC generators and are packed with grease before assembling; no further greasing is required. If considerable play is present in the bearing, it should be replaced with a new one. Whenever removing old bearings from the shaft of a defective armature use a bearing puller. Failure to do so may result in completely ruining the bearing.

Premature failure can be caused by running the drive belt too tightly. If new bearings are installed, be sure to press them against the shaft shoulder, so that when the armature is installed there is a small amount of end play. In installing new bearings, they should be pressed down with an arbor press or forced on by using a piece of pipe approximately the size of the inner race. Never exert any pressure on the outer race when installing a bearing on the shaft.

IX. LOCATING TROUBLE

If the wiring and speed are correct and the unit does not generate properly, first disconnect the load, then test the AC end, then the DC end and finally the armature. These step by step tests are given in the following paragraphs.

A. A.C. END TESTS

With the generator operating at 3600 rpm disconnect all external wiring by removing the plug or cap from the AC outlets. Use a voltmeter at the AC outlets to determine whether or not AC voltage is present under those conditions. (If no voltmeter is available, an ordinary 110 light bulb can be used with fair success).

1. If the correct voltage reading is obtained on open circuit, that is with all loads removed, the generator is very likely overloaded or there is a short in the external circuit. Decrease the load or locate and correct the short.

2. If low or no AC voltage is obtained at the outlet terminals, continue to run the generator on open circuit and check the AC voltage at the brushes. This can be done by unscrewing the brush caps one-half way as shown in Figure 12, using a pair of sharp prods of the voltmeter to connect directly to the brush holders; about 120 volts should be obtained at this point with the generator running at normal speed. If the correct AC voltage is obtained at the brushes but not at the AC outlets, there must be an open circuit between the brushes and outlets.

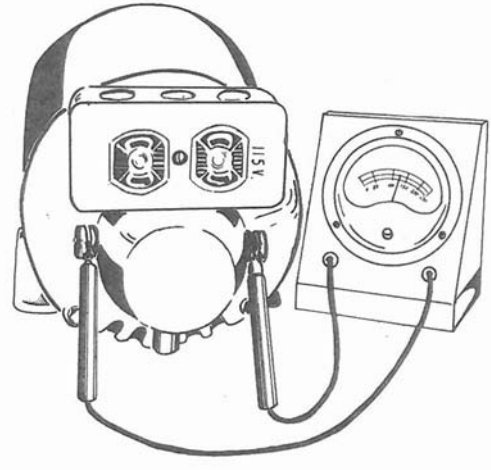

Figure 12

a. On 1000 watt models allow the generator to cool several minutes and push down on the red button. If the klixon had opened, this would again close the circuit and voltage should be available at the outlet terminals. (Some Model 1800s have automatic reset klixons which snap shut when the generator has cooled sufficiently). If an open circuit in the klixon is suspected, check with an ohmeter.

b. On 2000 watt models install a new fuse since the fuse may have blown.

If an open circuit is detected between the A.C. brushes and outlets, but the overload protective device is satisfactory, carefully examine all leads and connections. Correcting the open circuit should restore the unit to operation.

B. D.C. END TESTS

1. If no voltage is obtained at the AC brushes, check the DC end to make sure that the field coils are being energized. With the generator running at normal speed, unscrew one of the DC brush caps and allow the brush to move back and forth so that it makes and breaks contact with the commutator. If the DC part of the generator is working properly, some arcing or flashing will be obtained at the generator brush when the field circuit is broken; a few seconds of time must be allowed for the voltage to build up before repeating the test. In a darkened room this arcing can be seen by reflection through the bottom ventilation holes in the generator. If there is too much light present, use a mirror or look directly through the ventilation slots to determine whether or not arcing is produced when a brush is lifted. A slight difference in the tone of the generator will also be observed as the generator is allowed to build up a voltage if the DC part of it is working correctly.

2. If the generator builds up a satisfactory DC voltage but no AC voltage is produced, very likely there is a defect in the winding on the armature. Have it checked at a generator repair shop.

3. If the DC end is found not to be working properly, proceed as follows:

a. If new DC brushes have been installed, perhaps they are not seated properly. Remove the brush caps and insert a small stick of wood or plastic through the brush springs, so that the top of the brush can be reached in order to force the brush down firmly against the commutator as shown in Figure 13.

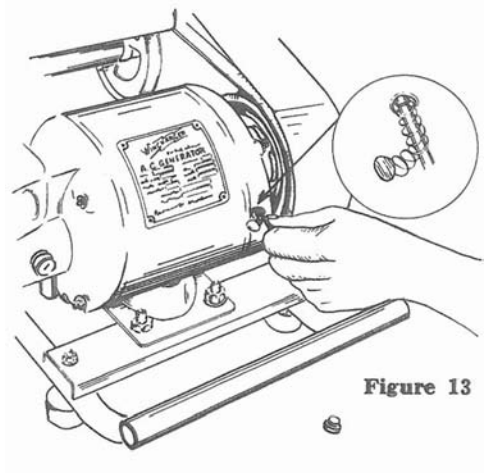

Figure 13

After running a few minutes if the generator builds up voltage, put the brush caps back in the proper position and the generator should work properly.

b. If the DC brushes have been properly seated, it is possible that they are sticking. Remove them from the brush holder and examine the holders for roughness or binding. Although it is improbable that the brushes will stick because of being oversize, a small amount can be filed off the edges if it is found that they are sticking in the brush holders.

c. If the brushes are found to be making satisfactory contact with the armature but no DC voltage is built up to energize the field coils, stop the generator and check the field circuit with a test light. This test light consists of two insulated test prods, a male plug, and a light bulb connected as shown in Figure 14. CAUTION: BE CAREFUL NOT TO TOUCH THE CONDUCTORS AT THE END OF THE PRODS SINCE THEY ARE CONNECTED TO THE POWER LINE. WHEN USING THE TEST LIGHT ON ANY EQUIPMENT, ALWAYS MOUNT IT ON A WELL-INSULATED BASE SUCH AS DRY WOOD, GLASS, OR RUBBER. DO NOT TOUCH THE OBJECT WHILE IT IS BEING SUBJECTED TO TEST.

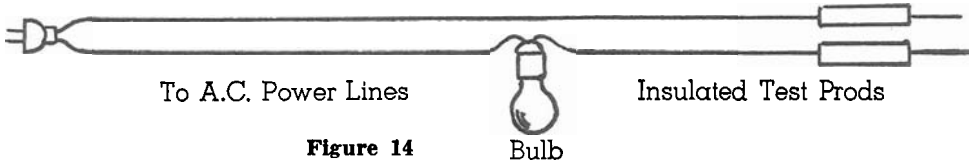

Figure 14

d. To test the field circuit proceed as follows: Remove the brush holder caps and brushes. Connect one test prod to the metallic part of the brush holder. Similarly connect the other test prod to the other brush holder. If the bulb lights, the field coils are probably o. k. If the bulb does not light, there is an open circuit in the field. Disassemble the generator and check the connection where the two coils are connected together. Tighten or resolder any connections which are found loose.
If no open circuit is present, check them for grounds by touching one test prod to the metallic part of the brush holder and the other part to the generator frame. The test bulb should not light. If it does, there is a short between these two parts. Examine the brush holder—usually causes of shorts in this part of the circuit are readily apparent, and the difficulty can be easily corrected by cleaning out the foreign material, such as carbon, grease, dirt, etc., or by taping the shorting parts or repositioning the field coil terminals.

C. ARMATURE

If no troubles can be located in either the AC end or DC end, very likely there is a defect in the windings of the armature. To test the armature special equipment is required; this should be done in a generator service shop.

X. PARTS LIST FOR WINCO A.C. GENERATORS

MODEL 700, MODEL 1800, and MODEL 3030 SERIES

Model	Engine Type	Model No. Without Engine	Engine Pulley	Engine Pulley Key	V Belt
700-11	Briggs & Stratton #6	700-1	20284	20287	20282
700-12	Clinton B-700	700-2	20284	20287	20282
700-13	Continental 7-B	700-3	20284	20287	20282
700-14	Lauson RSH	700-4	20284	20287	20282
1800-11	Briggs & Stratton #8	1800-1	20284	20287	20282
1800-12	Clinton D-1100	1800-2	20245	20287	20282
1800-13	Cushman M-6	1800-3	20246	20287	20248
1800-14	Lauson TLH	1800-4	20245	20287	20282
1800-15	Wisconsin ABN	1800-5	20247	20299	20248
3030-11	Briggs & Stratton #14	*3030-X	20247	20299	20563
3030-12	Briggs & Stratton #23	*3030-X	20247	20299	20563

*20284 Pulley is also supplied with model 3030-X and 3100-X

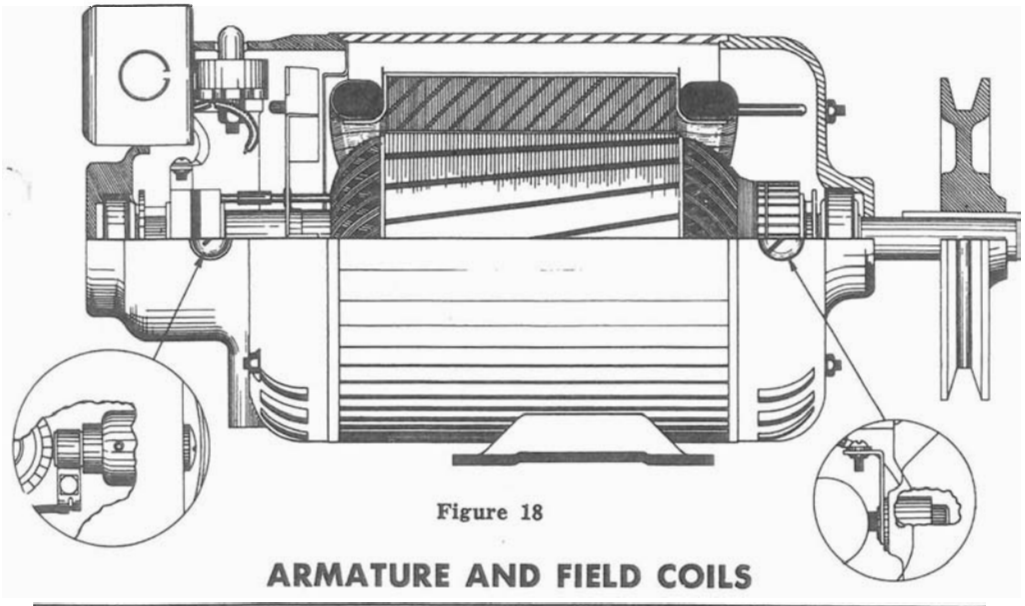

Figure 18

ARMATURE AND FIELD COILS

Model 700	Model 1800	Model 3030	Description
20266	20290	20585	Armature
20268(set)	20260	20590	Top Field Coil
	20260-1	20590-1	Bottom Field Coil

SLIP-RING END (A.C. OUTLET END) PARTS

5367	*20510	20510	A.C. Brush (2 req'd)
5065	*25099	25099	Brush Holder Cap
8645	*20509	20509	Brush Holder
6383	6383	6383	Brush Holder Set Screw
6211	6211	6211	Bearing
7227	7227	7227	Oil Slinger
6532	6532	6532	Shim
7924	7924	7924	Fan Baffle
----	9775	----	Klixon Thermo Switch
----	----	20577	Fuse Fustron
9706	9706	9706	Twist Lock Receptacle
20511	20511	20511	Twist Lock Cap
----	----	4667	Fuse Receptacle
----	----	9978	Voltmeter
----	----	20574	Voltmeter Receptacle
8617-1	8617	20582	End Bracket

*Model 1800 with serial numbers below 1360 uses same brushes, brush holders, and caps as Model 700.

D.C. END (PULLEY END) PARTS

7978	7978	7978	D.C. Brushes (2 req'd)
7948	7948	7948	Brush Holder Cap
7944	7944	7944	Brush Holder Assy.
6383	6383	6383	Brush Holder Set Screw
4783	4783	4783	Bearing
20410	20410	20410	Oil Slinger
20251 22739	20251 22739	20251 22739	End Bracket
20288	20288	20288	Gen. Pulley
20287	20287	20287	Gen. Pulley Key
20330	20330	20539	Belt Guard

MISCELLANEOUS PARTS

20305	20305	20570	Frame and Feet Assy.
20191	20191	20191	Rubber Foot
20235-1	20250-1	20600-1	Generator, less pulley

Engine parts are available from engine manufacturer's local dealer or distributor.

XI. TRACTOR DRIVEN UNITS

Model 3030A and 3030B, shown in Figure 15, use the same generator as other 2000 watt models described in this booklet. The model 3030A has a 4" diameter flat drive pulley (Part No. 9974) for a belt speed of 1885 feet per minute. The model 3030B is the same except it has a 5½" diameter pulley (Part No. 9975) for a belt speed of 2590 feet per minute. Any flat belt from 3½" to 6" wide can be used.

The counter shaft is mounted on two No. 9948 Pillow Block bearings and runs at 1800 R.P.M. The counter shaft V pulley (Part No. 9743) is used to give a 2:1 ratio to the generator speed. This unit uses V-Belt No. 9741 and Generator Pulley No. 20288.

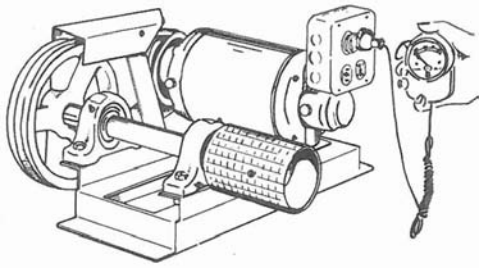

Figure 15

XII. ACCESSORIES

A. SPEEDY SHIFT BASE

All models described in this booklet designed for mounting the engine directly on the frame can be quickly converted to portable use by the use of a "Speedy Shift" attachment. This consists of wheels, axle, support brackets, handle, and the necessary bolts, etc. Figure 16 shows how the parts are attached. The engine and generator have been removed to show attachment details. The dealer from whom you purchased the unit can supply the accessory.

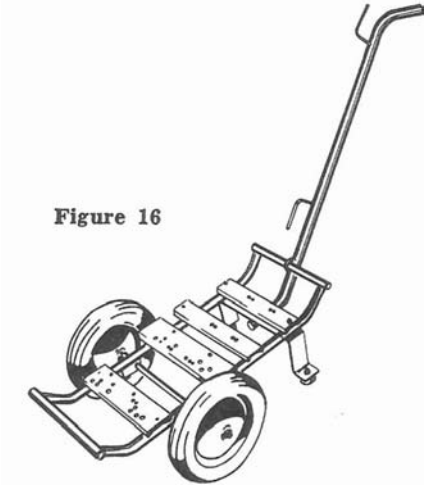

Figure 16

B. VOLTMETER

A plug-in type voltmeter, Figure 17, is supplied on Model 3030. It can be plugged into the outlet box or into a regular wiring outlet to maintain a close check on the voltage. It can also be supplied as an accessory on other models (Part No. 9978).

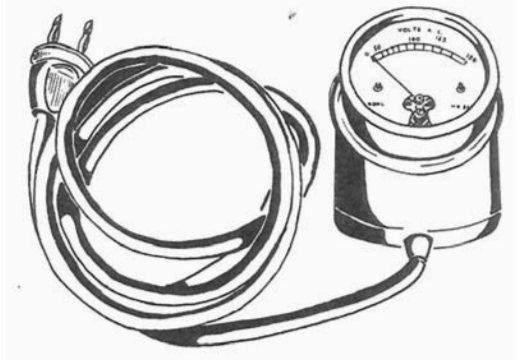

Figure 17